

We claim:

1 1. A telecommunications interface for communicating subscriber data containing
2 voice, and signaling, and user data between (1) a digital network, (2) a digital loop
3 carrier having an analog interface to connect telephones and a digital circuit connecting
4 said telephone switch to other telephone switches, and (3) a subscriber link to equipment
5 at a subscriber's premise, said interface comprising:

6 a controller;

7 a modem configured to modulate and demodulate said subscriber data to and
8 from said subscriber link to generate a digital stream containing said voice, and signaling,
9 and user data;

10 a digital filter configured to separate said voice data from said digital stream;

11 said controller being programmed to apply said voice data to said digital circuit
12 when said signaling data indicates said voice data is to be transmitted by said digital
13 circuit;

14 said controller being programmed to apply said voice data to said digital network
15 when said signaling data indicates said voice data is to be transmitted over said digital
16 network.

1 2. An interface as in claim 1, wherein said controller is programmed to
2 communicate with a network controller of said digital network and to generate a message
3 to said network controller requesting an allocation of resources of said digital network
4 responsively to said signaling data.

1 3. An interface as in claim 2, wherein said message is a request for bandwidth for
2 a voice call.

1 4. An interface as in claim 1, wherein said subscriber link includes multiplexed
2 digital communication over a metallic medium.

1 5. An interface as in claim 4, further comprising:
2 a termination device connectable to said metallic medium;
3 said termination device including an over-voltage protector.

1 6. An interface as in claim 5, wherein said termination device includes a line
2 monitor programmed to monitor a condition of said subscriber link at a time when there
3 is substantially no subscriber data traffic on said subscriber link.

1 7. An interface as in claim 1, further comprising:
2 said digital loop carrier has, connected to said digital circuit, a terminating
3 multiplexer to which said subscriber lines may be connected, said terminating multiplexer
4 converting analog telephone signals from said subscriber lines to a DLC digital format
5 and applying said telephone signal so-converted to said digital circuit;

6 a multiplexer controlled by said controller and connectable to said digital circuit
7 and configured to generate data in said DLC format providing substantially an
8 appearance to said backplane of an additional one of said terminating multiplexers,
9 whereby said voice data may be applied to said digital circuit when said signaling data
10 indicates said voice data is to be transmitted by said digital circuit.

1 8. An interface as in claim 1, wherein said subscriber data is a time-domain
2 multiplexed signal which is generated to provide 100 percent priority to said voice data.

1 9. An interface as in claim 1, wherein said subscriber data includes multiple
2 simultaneous voice channels, each associated with one of a separate carrier frequency
3 and a separate time domain channel.

1 10. An interface as in claim 1, wherein said signaling data includes a called
2 number.

1 11. An interface as in claim 1, further comprising:
2 a data storage unit connected to said controller, said data storage unit having
3 subscriber data relating to specific services for a subscriber;
4 said controller being programmed to apply said voice data to said digital circuit
5 when said signaling data and said subscriber data indicate said voice data is to be
6 transmitted by said digital circuit;
7 said controller being programmed to apply said voice data to said digital network
8 when said signaling data and said subscriber data indicate said voice data is to be
9 transmitted over said digital network.

1 12. An interface as in claim 1, further comprising:
2 a DTMF generator;
3 said interface being connected to a switched network requiring the transmission
4 of DTMF tones for calls to be routed through said switched network;
5 said DTMF generator generating DTMF tones in response to said signaling data
6 indicating said call is to be transmitted through said switched network.

1 13. An interface as in claim 1, wherein said controller is programmed to
2 communicate with a network controller of said digital network and to generate a message
3 to said network controller requesting a reallocation of resources of said digital network
4 responsively to an end of transmission of said voice data.

1 14. An interface as in claim 13, wherein said message is a request for increased
2 bandwidth at a priority lower than a priority assigned for a voice circuit of said digital
3 network.

1 15. A central office interface between a multiple access link to a subscriber
2 premises and a local carrier network:

3 a digital loop carrier with a digital interface to permit access to a digital
4 backplane of said digital loop carrier;

5 a controller with a modulator/demodulator configured to apply data
6 corresponding to multiple voice call sessions from said link to said digital interface, and
7 to apply data corresponding to said multiple voice call sessions from said digital interface
8 to said link;

9 said multiple access link being established over a single twisted pair metallic
10 interface.

1 16. An interface as in claim 15, wherein said controller is configured to add a new
2 call to said multiple voice call session in response to signaling data received through said
3 digital interface.

1 17. An interface as in claim 16, wherein said new call corresponds to the same
2 called number as at least another call of said multiple voice call session, whereby multiple
3 calls to a same called number are enabled.

1 18. An interface as in claim 15, wherein:
2 said controller is connected to another digital network;
3 said controller is configured to add a new call to said multiple voice call session
4 in response to signaling data received through said another digital network.

1 19. An interface as in claim 15, wherein:
2 said controller is connected to another digital network;
3 said controller is configured to add a new call to said multiple voice call session
4 in response to signaling data received through said link, said controller being further
5 configured to route selectively said new call through said another digital network
6 responsively to signaling data received through said link.

1 20. An interface as in claim 19, further comprising:
2 a data storage unit;
3 said controller being further configured to route said new call responsively to
4 signaling data and subscriber data corresponding to said call, said subscriber data indicating
5 services permitted for a calling party corresponding to said call.

1 21. A method of connecting telecommunication call sessions from multiple
2 stations at a subscriber premise, comprising the steps of:
3 generating signaling data at a one of said stations;
4 transmitting said signaling data over said multiple access link to said network
5 interface;
6 in response to receiving said signaling data at said network interface, transmitting
7 said signaling data over one of a digital loop carrier and a digital network responsively to a
8 called number in said signaling data;
9 allocating a channel in a multiple access link to a network interface to
10 communicate data over said link, said user data corresponding to said signaling data;
11 deallocating said channel responsively to a termination of said user data.

1 22. A method as in claim 21, wherein said user data includes voice data.

1 23. A method as in claim 22, wherein said step of allocating includes allocating
2 a channel providing 100% priority.

1 24. A method of connecting telecommunication call sessions from multiple
2 stations at a subscriber premise through a multiple access subscriber link, comprising the
3 steps of:
4 providing a digital interface to a backplane of a digital loop carrier;
5 generating signaling data at a one of said stations;

6 transmitting said signaling data over said multiple access link to said network
7 interface;

8 in response to receiving said signaling data at said network interface, applying
9 said signaling data to said digital interface to create an appearance of a POT connected
10 through a line card connected to said backplane.

1 25. A method as in claim 24, further comprising the steps of:
2 generating further signaling data at another one of said stations
3 transmitting said further signaling data over said multiple access link to said
4 network interface;

5 setting up a call session for transmission through a virtual channel of a digital
6 network connected to said network interface;

7 said step of setting up a call including transmitting a request on a signaling
8 channel of said digital network for bandwidth required for a call corresponding to said
9 signaling data;

10 applying subsequent voice data in a virtual channel responsively to a result of said
11 step of transmitting a request.

1 26. A method of connecting telecommunication call sessions from multiple
2 stations at a subscriber premise through a multiple access subscriber link, comprising the
3 steps of:

4 providing a digital interface to a backplane of a digital loop carrier;
5 generating signaling data at a one of said stations;
6 transmitting said signaling data over said multiple access link to said network
7 interface;

8 generating DTMF tones and applying said tones to a telecommunications switch
9 responsively to said signaling data and then subsequently connecting a call initiated at said
10 one of said stations through a channel opened up in said step of applying said tones;

11 generating further signaling data at another one of said stations
12 transmitting said further signaling data over said multiple access link to said
13 network interface;
14 setting up a call session for transmission through a virtual channel of a digital
15 network connected to said network interface;
16 said step of setting up a call including transmitting a request on a signaling
17 channel of said digital network for bandwidth required for a call corresponding to said
18 signaling data; and
19 applying subsequent voice data in a virtual channel responsively to a result of said
20 step of transmitting a request.

1 27. A method of connecting telecommunication call sessions from multiple
2 stations at a subscriber premise through a multiple access subscriber link, comprising the
3 steps of:

4 generating an indication of an initiation of a voice-dialing call at one of said
5 stations;
6 transmitting said indication through said link to network interface;
7 upon receipt of said indication at said network interface, opening a channel in a
8 digital network having a server;
9 transmitting voice data corresponding to said called number through said channel
10 to said server;
11 receiving signaling data at said network interface, transmitted by said server in
12 response to a receipt, said signaling data being responsive to said voice data;
13 connecting a call at said network interface responsively to said signaling data.

1 28. A method as in claim 27, wherein said step of connecting includes placing a
2 call at said network interface through a local exchange carrier (LEC) network separate from
3 said digital network and channeling said call through said link.

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29. A method as in claim 28, wherein said LEC network is an analog network.

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